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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,888	09/12/2003	Mohamad El-Batal	LSI.81US01 (03-1078)	6950

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EXAMINER	
CHERY, MARDOCHEE	
ART UNIT	PAPER NUMBER
2188	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/660,888	EL-BATAL ET AL.	
	Examiner	Art Unit	
	Mardochee Chery	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 11/06/2006
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to applicant's communication filed on January 3, 2007, in response to PTO Office Action mailed on October 3, 2006. The applicant's remarks and amendments to the claims and/or the specification were considered with the results that follow.

2. Claims 1-24 are currently pending.

Response to Arguments

3. Applicant's arguments filed January 3, 2007 have been fully considered but are not persuasive.

a. Applicants argue on page 6 of the remarks that "the present claimed invention does not create a delta file by comparing two existing, already stored files and identifying the modified portions for a backed up file, as suggested by Burns. Rather, the delta file of the present invention is recited as: "...storing a record of said changes in said delta log;" and cite Burns, col. 4., ll 21-46 and col. 5, ll 25 to col. 6, ll 5 in support to these allegations.

Examiner respectfully disagrees with applicants' contention and would like emphasize that Burns does not disclose "create a delta file by comparing two existing, already stored files" as alleged by applicants. As a matter of fact, there is no disclosure in Burns of such whether in the explicit or

implicit. Contrary to applicants' assumption and in the same section cited in support of these allegations, it is manifest that Burns instead discloses "the file changes from a prior version define what is called a delta file; this delta file compactly represents A2 as a set of changes to A1; col. 5, ll 25 to col. 6, ll 5 or page 6 of applicants' remarks filed on January 3, 2007. Thus, it is evident that Burns clearly discloses "storing a record of said changes in said delta log" of claim 1.

b. Applicants argue on page 8 of the remarks that "Burns has not been combined with Rezaul since in the system of Burns file A1 is not taken offline when A2 is being updated while the system of Rezaul requires that the failed storage device be removed from the RAID system".

i. Examiner respectfully disagrees with such contention. Examiner is unable to derive how applicants arrive at the conclusion that Burns teaches away from Rezaul by simply stating the mere fact that Burns teaches file A1 is not taken offline when A2 is being updated while the system of Rezaul requires that the failed storage device be removed from the RAID system. Such narrowly interpreted recitation does not explain nor constitute teaching away. Examiner further notes that applicants simply rely on two lines of both disclosures to allege the fact that Burns teaches away from Rezaul.

ii. Examiner would like to further mention that a prior art reference must be considered in its entirety, i.e., as a whole and the prior art disclosure of more than one alternative does not constitute a teaching away because such disclosure does not criticize, discredit, or otherwise discourage the claimed method for recovering data in a redundant data storage system. In re Fulton 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146.

i. Since Rezaul Islam's and Burns' are in the same filed of endeavor (i.e. data backup, storage and recovery system) as Applicant's invention and are pertinent to the particular problem with which Applicant's was concerned (i.e. data backup and recovery in a storage system), the references can be relied upon as a basis for rejection of the claimed invention and should not be construed as teaching away from one another. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

ii. Additionally, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the

motivation to combine the references could be found in Burns, col. 5, ll 55 to col. 6, ll 5 [to achieve an efficient and cost effective backup mechanism to reduce the amount of information sent to a backup server in association with keeping file data consistent and recoverable].

c. Applicants argue on page 8, paragraph 3 of the remarks that Hesselink does not teach "starting a delta log concurrently with the step of removing one of a plurality of data storage units".

(1) Examiner respectfully disagrees. First of all, Examiner would to point out that the combination of Rezaul, Burns and Heselink is relied upon in the rejection of the claims. Burns clearly discloses in col. 4, ll 21-46, col. 5, ll 25 to col. 6, ll 5, and as shown on pages 5-6 of applicants remarks filed on January 3, 2007, "File A1 is unlinked (i.e., offline) and A2 is linked as part of the same transaction and backup for file A2 is initiated which involve backing up only the modified portions with respect to A1; the file changes from a prior version define what is called a delta file".

(2) Additionally, Hesselink discloses "during the time that computer 72 is offline or disconnected from the network, user module 72su may still be able to store changes that are made with respect to the file data; par. 0166".

d. In view of the foregoing discussion, it has been made manifest that applicants' claimed invention is not patentably distinct, when interpreted in light of the specification, over the combination of Rezaul, Burns, and Hesselink and that Burns does not teach away from Rezaul and is indeed in the same field of endeavor and proper motivation to combine the references has been sufficiently spelled out throughout all of the Office actions. Therefore, the rejection of claims 1-24 is strictly maintained.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4, 6-12, 14-20, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rezaul (6,282,670) in view of Burns (6,088,694) and further in view of Hesselink (2005/0149481).

As per claim 1, Rezaul discloses a method for recovering data in a redundant data storage system having a plurality of data storage units, said method comprising: storing said data on said plurality of data storage units according to a redundant data storage method [col.2, lines 18-29]; removing one of said plurality of data storage units [col.4, lines 33-42]; while said one of said plurality of data storage units is removed,

changing a portion of said data on the remainder of said plurality of data storage units and [col.4, lines 36-43]; replacing said one of said plurality of data storage units [col.1, line 66 to col.2, line 6]; and updating said one of said plurality of data storage units [col.2, lines 18-27].

However, Rezaul does not specifically teach storing a record of said changes in a delta file and updating those portions of data recorded in said delta file as required by the claim.

Burns discloses storing a record of changes in a delta file and updating portions of data recorded in the delta file [col.5, line 61 to col.6, line 5] in order to achieve efficient and cost effective backup of data (col.6, lines 3-5).

Since the technology for implementing a storage recovery system with storing a record of changes in a delta file and updating portions of data recorded in the delta file was well known as evidenced by Burns, an artisan would have been motivated to implement this feature in the system of Rezaul in order to achieve efficient and cost effective backup of data. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Rezaul to include storing a record of changes in a delta file and updating portions of data recorded in the delta file because this would have achieved efficient and cost effective backup of data (col.6, lines 3-5) as taught by Burns.

However, Rezaul and Burns do not specifically teach starting a delta log concurrently with said step of removing one of said plurality of data storage units as required.

Hesselink discloses starting a delta log concurrently with said step of removing one of said plurality of data storage units [par. 166, ll 9-20] to allow the storage unit to later obtain changes that were made during the offline period (par. 166, ll 15-19).

Since the technology for implementing a storage recovery system with starting a delta log concurrently with said step of removing one of said plurality of data storage units was well known as evidenced by Hesselink, an artisan would have been motivated to implement this feature in the system of Rezaul and Burns since this would have allowed the storage unit to later obtain changes that were made during the offline period. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Rezaul and Burns to include starting a delta log concurrently with said step of removing one of said plurality of data storage units because this would have allowed the storage unit to later obtain changes that were made during the offline period (par. 166, ll 15-19). as taught by Hesselink.

As per claims 9 and 17, the rationale in the rejection of claim 1 is herein incorporated. Rezaul further discloses a redundant data storage system capable of fast restoration of serviced data storage units comprising: a plurality of data storage units [col.4, lines 33-44]; and a controller that stores data on said plurality of data storage units according to a redundant data storage method, changes a portion of said data

after taking one of said plurality of said data storage units off line, stores a record of the changes in a delta log that are made to the remainder of the plurality of said data storage units, brings said one of said plurality of said data storage units online, and updates said one of said plurality of said data storage units by updating those portions of data recorded in said delta file [Fig.1, controller 120; col.17, lines 46-60].

As per claims 2, 10 and 18, Rezaul discloses the redundant data storage method comprises RAID 1 [col.1, line 66 to col.2, line 15].

As per claims 3, 11 and 19, Rezaul discloses redundant data storage method comprises RAID 3 [col.2, lines 43-57].

As per claims 4, 12 and 20, Rezaul discloses redundant data storage method comprises RAID 5 [col.3, lines 30-45].

As per claims 6, 14 and 22, Rezaul discloses the one of said data storage units comprises a plurality of disk drives [Fig.1].

As per claims 7, 15 and 23, Burns discloses delta file comprises pointers to said portion of said data that is changed Fig.6].

As per claims 8, 16 and 24, Burns discloses the delta file comprises an updated version of the portion of the data that is changed [Fig.8].

6. Claims 5, 13, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rezaul (6,282,670) in view of Burns (6,088,694), Hesselink (2005/0149481) as applied to claims 1, 9, and 17 respectively, and further in view of McCabe (2002/0016827).

As per claims 5, 13 and 21, McCabe discloses the redundant data storage method comprises remotely mirroring the data [Fig.3; par.20] in order to provide better fault tolerance and/or disaster recovery (par.2).

Since the technology for implementing a storage recovery system with remote mirroring was well known as evidenced by McCabe, an artisan would have been motivated to implement this feature in the system of Rezaul, Burns and Hesselink in order to provide better fault tolerance and/or disaster recovery. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system o f Rezaul, Burns and Hesselink to include remote mirroring because this would have provided better fault tolerance and/pr disaster recovery (par.2) as taught by McCabe.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

When responding to the office action, Applicant is advised to clearly point out the patentable novelty that he or she thinks the claims present in view of the state of the art disclosed by references cited or the objections made. He or she must also show how the amendments avoid such references or objections. See 37 C.F.R. 1.111(c).

8. When responding to the Office action, Applicant is advised to clearly point out where support, with reference to page, line numbers, and figures, is found for any amendment made to the claims.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mardochee Chery whose telephone number is (571) 272-4246. The examiner can normally be reached on 8:30A-5:00P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough can be reached on (571) 272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

April 2, 2007

HYUNG SOUGH
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4-02-07

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